Space Weather Forecast

Issued on Wednesday, 30 March 2022 at 13:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further Moderate-class flares throughout. Slight chance of further S1 or above solar radiation storms. G1-G2/Minor-Moderate geomagnetic storms are expected on Days 2 and 3 (31 March and 1st April), with a Chance of a G3/Strong storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity continues at Moderate levels, with one M-class flare through the period originating from AR2975.
There are currently three visible numbered sunspot regions on the Earth facing disc. AR2975 (NW quadrant) remains magnetically complex and continues to develop. AR2976 also in the northwest quadrant is currently the largest sunspot, although remains stable. AR2978 (SE quadrant) is a wide bi-polar group with a large lead spot. AR2974 and AR2980 both decayed to plage. Two new regions have emerged, these will be monitored for development.
No new Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: Solar wind speeds have been at slightly elevated levels, mainly between 400-430 km/s. The strength of the Interplanetary Magnetic Field has been at weak levels, with the north-south component showing weak fluctuations. Geomagnetic activity was mostly Quiet (Kp 1-2), with BGS showing one Unsettled (Kp 3) interval.

Energetic Particles / Solar Radiation: The high energy proton flux (10 MeV) measured at GOES-16 continued a slow decline following the S1/Minor solar radiation storm on 28th March.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mostly Low, but with the chance of further Moderate-class flares, mainly from AR2975.

Solar Wind / Geomagnetic Activity: The next enhancement is expected to come from the 28th March CME(s), which are anticipated to arrive, as a combined CME at Earth on Day 2 (31 March). CME effects are then expected to continue into Day 3 (1st April), before gradually weakening into Day 4 (2nd April).
Quiet to Unsettled conditions are expected until Day 2 (31st Mar), when Active to G1-G2/Minor-Moderate storm periods are expected, with the Chance (30%) of a G3/Strong Storm, and perhaps a Slight Chance (10%) of a G4/Severe Storm. Disturbed geomagnetic conditions are expected to continue into Day 3 (1st April), before gradually easing into Day 4 (2nd April).

Energetic Particles / Solar Radiation: The continued activity of 2975 in particular gives the slight chance of further potential enhancements above the S1 threshold during the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	80	60	10
Strong	G3	No	1	30	30	1
Severe	G4	No	1	10	10	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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